



Ms. Liane Randolph Chair, California Air Resources Board 1001 I Street Sacramento, CA 95814

## Submitted Electronically

Re: Comments regarding the 15-day public notice for the proposed amendments to California's Low Carbon Fuel Standard

Dear Chair Randolph,

Thank you for the opportunity to provide comments on the 15-day public notice for the proposed amendments to California's Low Carbon Fuel Standard. Environmental Defense Fund (EDF) appreciates the work CARB staff has dedicated to amending the Low Carbon Fuel Standard. EDF looks forward to continuing to engage in this rulemaking and supporting the successful decarbonization of California's transportation sector.

As we have stated in previous comments, updating LCFS to increase the program's ambition and efficacy will be integral to ensuring California can deliver the outcomes and emissions reductions envisioned in the final Climate Change Scoping Plan, as well as achieve carbon neutrality by 2045.

We are pleased to see amendments that strengthen the CI reduction benchmarks both pre- and post-2030. EDF hopes that this increased rigor alongside other amendments will sustain the LCFS's role in promoting the use of lower carbon alternatives, thus bringing substantial health, economic, and environmental benefits. To that end, we offer the following comments regarding three aspects of the proposed LCFS amendments: 1) crediting for manure biogas, 2) crediting for medium- and heavy-duty vehicle charging, and 3) sustainable decarbonization of the aviation sector.

## 1. Crediting for Manure Biogas

Agriculture, particularly the dairy industry, is a major source of California's methane emissions. Almost 25% of California's total methane emissions are estimated to come from dairy manure. Addressing dairy manure methane emissions is a key action needed to meet California's climate goals. We applaud the state for establishing a specific methane reduction for the dairy and livestock sectors in SB 1383 (Lara, 2016). California dairy farmers, as price takers, have little market power to pass costs associated with methane reduction solutions on to the consumer, we therefore also recognize the significant role that programs such as the LCFS continue to play in incentivizing and supporting reductions in livestock methane sources.

We appreciate CARB's stance that capturing methane from landfills, dairies, and wastewater is critical to achieving climate targets, and we are aligned with CARB's preference for biomethane to be used to produce low-carbon intensity hydrogen and electricity. We agree that attention is needed to ensure methane capture projects are not abandoned as LCFS transitions away from combustion vehicles towards hard-to-decarbonize sectors.<sup>1</sup>

Manure biogas systems, when operated and installed in a responsibly maintained farm system, are a proven technology that can address existing sources of agriculture methane (from dairy manure storage systems) while replacing fossil fuel-derived methane. Given the considerable number of liquid manure systems that exist in California (and US) dairies, continuing to include manure biogas systems—as part of an environmentally comprehensive farm nutrient management system—in the LCFS is a powerful tool to drive agriculture methane reductions from existing sources. Continued eligibility is important to meet California's climate goals and drive further agriculture methane reductions across the US.

Today, the LCFS is the most impactful market-based tool to incentivize livestock farmers to adopt methane capture technologies. However, as with any program, it is not perfect. We cannot focus on solving methane, a global climate pollutant, without also ensuring meaningful improvement in the local environment and community.

# Local air quality impacts that result either directly or indirectly from anaerobic digestion must be addressed.

One of the most significant local air pollutants of concern surrounding biogas systems is ammonia. Approximately 80% of ammonia emissions in the United States, encompassing emissions from both natural sources and human activities, are from agricultural sources. Notably, around 60% of these national emissions stem from livestock manure.<sup>2</sup> Ammonia is a health concern, as it has the potential to form fine particulate matter (PM2.5), which can lead to respiratory and pulmonary issues in nearby communities.<sup>3</sup> Ammonia emissions also present an environmental risk contributing to soil acidification and/or eutrophication in downwind ecosystems.<sup>4</sup>

<sup>3</sup> <u>https://pubmed.ncbi.nlm.nih.gov/20458016/</u>

<sup>&</sup>lt;sup>1</sup> <u>https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf</u>

<sup>&</sup>lt;sup>2</sup> <u>https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data#doc</u>

<sup>4</sup> https://www.sciencedirect.com/science/article/pii/S0301479722018588?via%3Dihub

During anaerobic treatment or storage, manure organics decompose in an oxygen-free environment and produce methane, ammonia, and other gases. In open-system manure storage or treatment lagoons, as the manure undergoes anaerobic decomposition, most of these compounds are lost to the atmosphere. If the anaerobic decomposition takes place in an enclosed environment (such as a covered lagoon or anaerobic digester), the methane degases from the liquid phase and is captured under the cover where it can be collected and flared or used as a fuel. However, the ammonia stays in the solution and hence the dissolved ammonia becomes concentrated inside the anaerobic digester, particularly relative to that remaining dissolved in an open lagoon.

Once the digestate from the anaerobic digester or covered lagoon is discharged from beneath the cover into an open lagoon or storage tank, the ammonia is lost to the atmosphere in the same quantity or perhaps somewhat higher quantities, relative to that lost in an open lagoon, presenting a serious health risk to downwind communities.

We strongly recommend that any LCFS credit generated from biogas created from manure in covered lagoons or anaerobic digesters for hydrogen production should be predicated upon the management of the digestate to reduce ammonia losses. Specifically, in Section 95488.9(f)(1). Special Circumstances for Fuel Pathway Applications: *Carbon Intensities that Reflect Avoided Methane Emissions from Dairy and Swine Manure or Organic Waste Diverted from Landfill Disposal*, we recommend adding an additional requirement that the digestate from the digester from which the biomethane is captured must be treated to control ammonia emissions by using a cover or other mechanism to substantially reduce ammonia emissions.

Keeping the digestate in an enclosed system would greatly reduce the loss of ammonia from the digestate as well as allow for the capture of the residual methane in the digestate. The residual methane could be added to the digester biogas and used as fuel. An impermeable cover on the digestate reduces ammonia losses by 55-100% and residual methane emissions by 90% Error! Bookmark not defined. while a permeable cover is estimated to reduce ammonia by 40-80%.<sup>5</sup>

Farm systems can have a negative impact on local communities, specifically around air pollutants, odors, and other downwind ecosystem and water concerns. Producers of biomethane from digesters should have a robust system in place to participate in LCFS to ensure the digester and its nutrients are managed properly. It is critical that crediting be contingent upon meeting specific standards that further reduce environmental and community impacts.

## 2. Crediting for Medium- and Heavy-Duty Vehicle Charging

Medium- and heavy-duty vehicles are responsible for a disproportionate amount of greenhouse gas (GHG) emissions and local pollution relative to the size of their population. In California,

<sup>&</sup>lt;sup>5</sup> <u>https://extension.colostate.edu/topic-areas/agriculture/best-management-practices-for-reducing-ammonia-emissions-lagoon-covers</u>

despite the fact that trucks are just seven percent of all vehicles in the state, they emit nearly 33% percent of particulate matter, 25% percent of nitrogen oxides (NOx), and nearly 9% percent of greenhouse gas emissions<sup>6</sup> from the transportation sector; electrifying these vehicles will therefore produce outsized climate and local air pollution benefits. This is particularly important in the state's disadvantaged communities, because while the health impacts, which can negatively affect "every organ in the body,"<sup>7</sup> are experienced to some extent all across the state, "low-income and communities of color...are often disproportionately affected by emissions from freight movement due to their proximity to transportation infrastructure,"<sup>8</sup> such as ports, railyards, and freight corridors. Because of this disproportionate impact, there is an urgent need to electrify medium- and heavy-duty vehicles in these neighborhoods.

# CARB should remove the minimum nameplate power rating requirement for the MHD FCI program.

While EDF appreciates CARB lowering the FSE minimum nameplate power rating to 50kW, we still recommend removing the minimum nameplate power rating entirely. As noted in our previous comments, while some electric trucks and buses will rely on direct current fast chargers (DCFCs) with higher nameplate capacities, many will not require the same level of charging. This is particularly true for fleets operating out of and charging at private depots which may have shorter duty cycles and can spread their charging overnight and/or several daytime blocks with lower-power DCFC or level-2 charging. Removing the nameplate requirement would allow these fleets to optimize their charging based on their own operational needs, resulting in gridbeneficial charging behavior, while still remaining eligible for the program. Consistent with this recommendation, CARB should also remove or modify the limitation that no more than ten chargers per applicant per site would be eligible for credits. The proposed 10 MW cap per customer per site is a sufficient constraint on individual customers accumulating credits while retaining the flexibility for applicants to deploy chargers in number and capacity consistent with their needs. Otherwise, applicants would potentially be incentivized to oversize chargers' nameplate capacity to maximize credit eligibility.

## 3. Sustainable Decarbonization of the Aviation Sector

For almost a decade, EDF has been working to reduce harmful pollution from aviation to mitigate climate change and deliver public health benefits utilizing alternative fuels. This includes engagement in climate policy at the International Civil Aviation Organization (ICAO), leading and participating in expert working groups developing ICAO's Sustainability Framework for Sustainable Aviation Fuel (SAF) – an effort that builds heavily on California's Low Carbon Fuel Standard (LCFS). We were also deeply involved in the inclusion of SAF tax credits in the federal Inflation Reduction Act (IRA).

<sup>&</sup>lt;sup>6</sup> <u>https://ww2.arb.ca.gov/ghg-inventory-graphs</u>

<sup>7</sup> https://www.ucsusa.org/resources/cars-trucks-buses-and-air-pollution#toc-effects

<sup>&</sup>lt;sup>8</sup> https://ww2.arb.ca.gov/sites/default/files/2021-09/Proposed 2020 Mobile Source Strategy.pdf

The Low Carbon Fuel Standard program plays a significant role in California's decarbonization efforts in the aviation sector and any proposed reforms warrant thorough consideration. EDF believes that expanding the scope of LCFS to include aviation fuels beyond the existing voluntary opt-ins for alternative jet fuels<sup>9</sup> is a necessary step towards achieving carbon neutrality in California by 2045 and will likewise support collective climate ambition. The structured deployment of sustainable aviation fuels (SAF) in California is crucial for the civil aviation sector to reach the International Civil Aviation Organization (ICAO)'s global goal of net-zero climate impact by 2050.

# CARB should consider the inclusion of all fossil jet fuel in California during the next regulatory process.

EDF recommends that in the next regulatory process, CARB carefully consider the inclusion of all fossil jet fuel uplifted in California. Considering the full scope of aviation fuel ensures the greatest degree of climate benefits and that the aviation sector shares responsibility for a portion of the cost of deploying SAF uplifted in California. In the meantime, the State Strategy for the State Implementation Plan represents a unique opportunity for CARB to take a leadership role in protecting communities adversely affected by aviation's toxic emissions.

## CARB must protect workers' and airport-adjacent communities' health by considering action under the State Strategy for the State Implementation Plan.

Jet fuel-related emissions from landing and take-off operations disproportionately affect local communities, as well as workers within the airport envelope. Communities living in proximity to airports are exposed to elevated levels of ultrafine particles (UFP) and are at risk of adverse health effects, a critical issue upon which CARB needs to act without further delay.

While SAF blends uplifted in California have the potential to reduce harmful aviation emissions from take-off operations by reducing aromatic content, such an outcome will not happen unless additional regulations are enforced. Furthermore, the gradual scale-up of SAF means that a fuel swap will help only marginally in the near term - if at all - which is insufficient to protect overburdened communities already suffering decades' worth of accumulated adverse health effects.

To deliver tangible near-term public health benefits, CARB should expeditiously consider action under the State Strategy for the State Implementation Plan, with the goal of regulating jet fuel composition. Jet fuel aromatic content could be reduced with existing refining infrastructure in California while tapping on IRA's generous clean hydrogen subsidies to cushion price impacts

<sup>&</sup>lt;sup>9</sup> Important to note, 'alternative jet fuels' denotes a broader category than does 'SAF.' Per definitions established at the federal and international levels, 'SAF' refers solely to fuels produced using renewable energy sources, wastes and residues and meet sustainability criteria.

and GHG emissions penalties. This is low-hanging fruit measure that could slash PM2.5 emissions without adversely affecting safety, i.e., in a manner that would be fully compatible with existing federal airworthiness certifications.

Thank you for your consideration of these comments. EDF looks forward to continuing to work with CARB to update the LCFS. If you have questions or would like to discuss any of these recommendations, please contact Katelyn Roedner Sutter at <u>kroedner@edf.org</u>.

Sincerely,

Kat-fr Roedner Sutter

Katelyn Roedner Sutter California State Director